

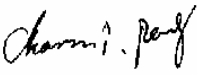

**FCC PART 15.249**  
**EMI MEASUREMENT AND TEST REPORT**

For

**WorkoutMouse, Inc**

201 Selrose Lane Santa Barbara, CA 93109, USA

**FCC ID: TZ7040961**

<b>This Report Concerns:</b> <input checked="" type="checkbox"/> Original Report	<b>Equipment Type:</b> Transmitter, WorkoutMouse
<b>Test Engineer:</b> Charmi Peng 	
<b>Report No.:</b> RSZ06102701	
<b>Test Date:</b> 2006-11-06- 2006-11-23	
<b>Report Date:</b> 2006-11-23	
<b>Reviewed By:</b> EMC Manager: Boni Baniqued 	
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## GENERAL INFORMATION

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### Product Description for Equipment under Test (EUT)

The *WorkoutMouse, Inc*'s product, model number: 040961 or the "EUT" as referred to in this report is a *WorkoutMouse*. The EUT is measured approximately 13.0 cm L x 4.5 cm W x 2.0 cm H, rated input voltage: DC 3V battery.

*\* The test data gathered are from production sample, serial number: 0610024 provided by the manufacturer, we received EUT on 2006-10-27.*

### Objective

This Type approval report is prepared on behalf of *WorkoutMouse, Inc* in accordance with Part 2, Subpart J, and Part 15, Subparts A, B and C of the Federal Communication Commissions rules.

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, and section 15.203,15.205,15.207,15.209 and 15.249 rules.

### Related Submittal(s)/Grant(s)

No Related Submittals.

### Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

All radiated and conducted emissions measurement was performed at Bay Area Compliance Laboratory Corp. (ShenZhen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

### Test Facility

The Test site used by Bay Area Compliance Laboratory Corp. (ShenZhen) to collect radiated and conducted emission measurement data is located in the 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone, ShenZhen, Guangdong 518038, P.R.China.

Test site at Bay Area Compliance Laboratory Corp. (ShenZhen) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on November 04, 2004. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2003.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 382179. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, Bay Area Compliance Laboratory Corp. (ShenZhen) is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200707-0). The current scope of accreditations can be found at <http://ts.nist.gov/ts/htdocs/210/214/scopes/2007070.htm>

## **SYSTEM TEST CONFIGURATION**

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### **Justification**

The system was configured for testing in a typical fashion (as normally used by a typical user).

### **EUT Exercise Software**

N/A.

### **Special Accessories**

The special accessories were supplied by Bay Area Compliance Laboratory Corp. (Shenzhen).

### **Equipment Modifications**

Bay Area Compliance Laboratory Corp. (ShenZhen) has not done any modification on the EUT.

## Configuration of Test Setup



Stand View



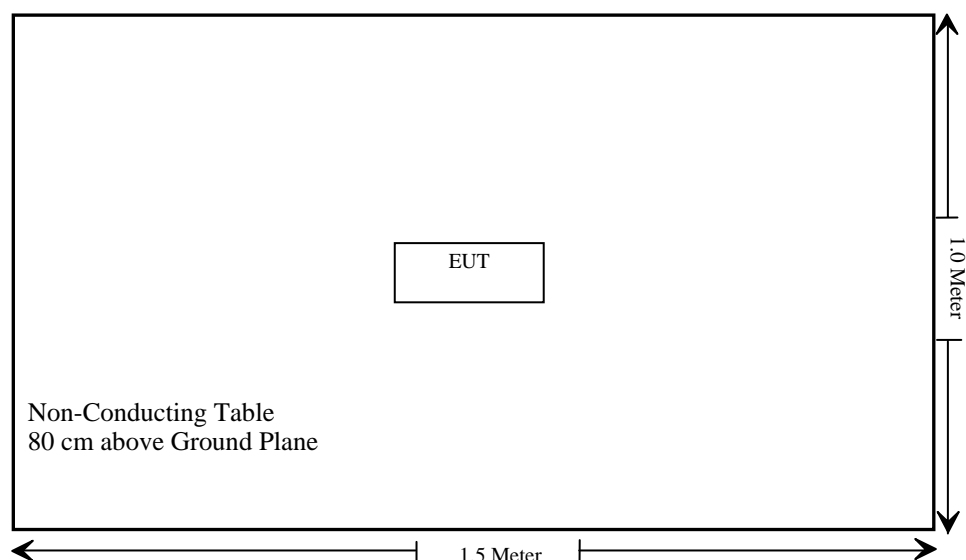
Side View



Lie View

Note: We tested Lie orientation, side orientation and stand orientation, the stand orientation is the worst mode, so we select the stand orientation to test.

## Block Diagram of Test Setup



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**SUMMARY OF TEST RESULTS**

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FCC RULES	DESCRIPTION OF TEST	RESULT
§15.203	Antenna Requirement	Compliant
§15.207(a)	Conduction Emission	N/A
§15.205(a), §15.209(a), §15.249(a)	Radiated Emission	Compliant
§15.249(d)	Out of band emission	Compliant

## **§15.203 - ANTENNA REQUIREMENT**

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### **Standard Applicable**

For intentional device, according to §15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used.

### **Antenna Connector Construction**

The EUT antenna is a permanently attached antenna, which in accordance to section 15.203, is considered sufficient to comply with the provisions of this section.

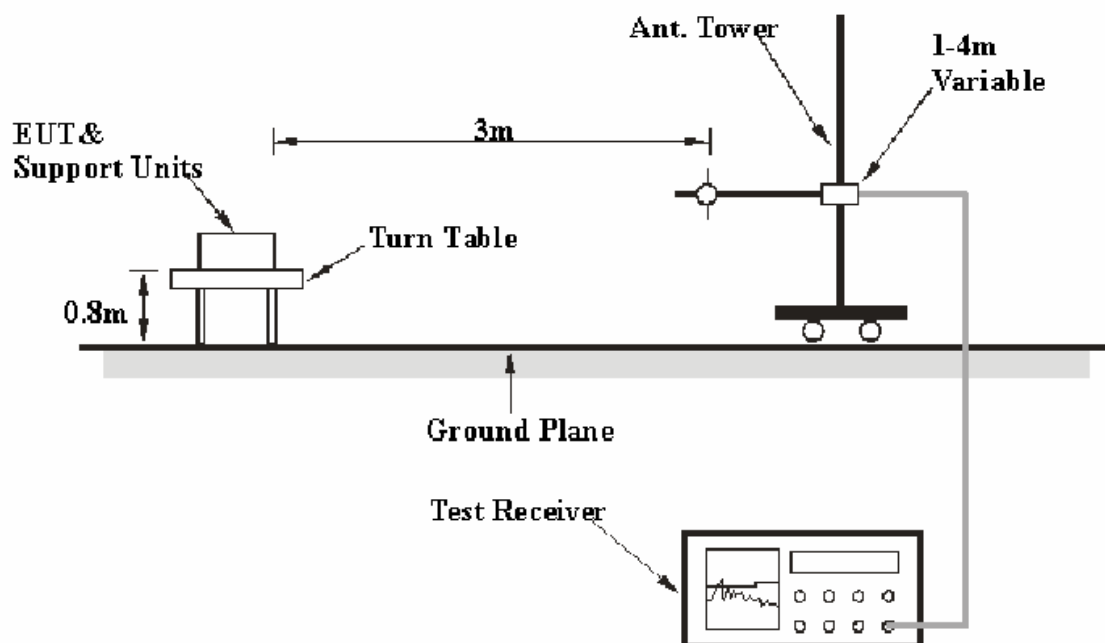
## §15.205 §15.209(a) §15.249(a) - RADIATED EMISSION

### Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at Bay Area Compliance Laboratory Corp. (ShenZhen) is  $\pm 4.0$  dB.

### EUT Setup



The radiated emission and out of band emission tests were performed in the 3 meters chamber B, using the setup accordance with the ANSI C63.4-2003. The specification used was the FCC 15.209 and FCC 15.249 limits.

The EUT is powered by DC 3V battery.



## EMI Test Receiver Setup

The system was investigated from 30 MHz to 25000 MHz.

During the radiated emission and out of band emission test, the test receiver was set with the following configurations:

<i><b>Frequency Range</b></i>	<i><b>RBW</b></i>	<i><b>Video B/W</b></i>
30 – 1000 MHz	100 kHz	300 kHz
1000 MHz – 25000 MHz	1MHz	3 MHz

## Test Equipment List and Details

<b>Manufacturer</b>	<b>Description</b>	<b>Model</b>	<b>Serial Number</b>	<b>Calibration Date</b>	<b>Calibration Due Date</b>
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2006-1-26	2007-1-26
HP	Amplifier	HP8447E	1937A01046	2006-8-17	2007-8-17
Sunol Sciences	Broadband Antenna	JB1	A040904-2	2006-4-28	2007-4-28
Agilent	Spectrum Analyzer	8564E	3943A01781	2005-12-8	2006-12-8
HP	Preamplifier	8449B	3008A00277	2006-8-17	2007-8-17
SUNOL SCIENCES	Horn Antenna	DRH-118	A052604	2006-7-20	2007-7-20

\* **Statement of Traceability:** Bay Area Compliance Laboratory Corp. (ShenZhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

## Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

All data was recorded in the peak and average detection mode.

## Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

$$\text{Cord. Amp.} = \text{Meter Reading} + \text{Antenna Loss} + \text{Cable Loss} - \text{Amplifier Gain}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Cord. Amp.} - \text{Limit}$$

## Test Results Summary

According to the data in the following table, the EUT complied with the FCC Part 15.209 & 15.249, with the worst margin reading of:

**30-1000MHz: -20.2 dB at 30.300667 MHz in the Horizontal polarization.**

**Above 1GHz:**

**Low Channel: -10.02 dB at 7230 MHz in the Horizontal polarization.**

**Middle Channel: -14.56 dB at 7305 MHz in the Horizontal polarization.**

**High Channel: -14.56 dB at 7350 MHz in the Vertical polarization.**

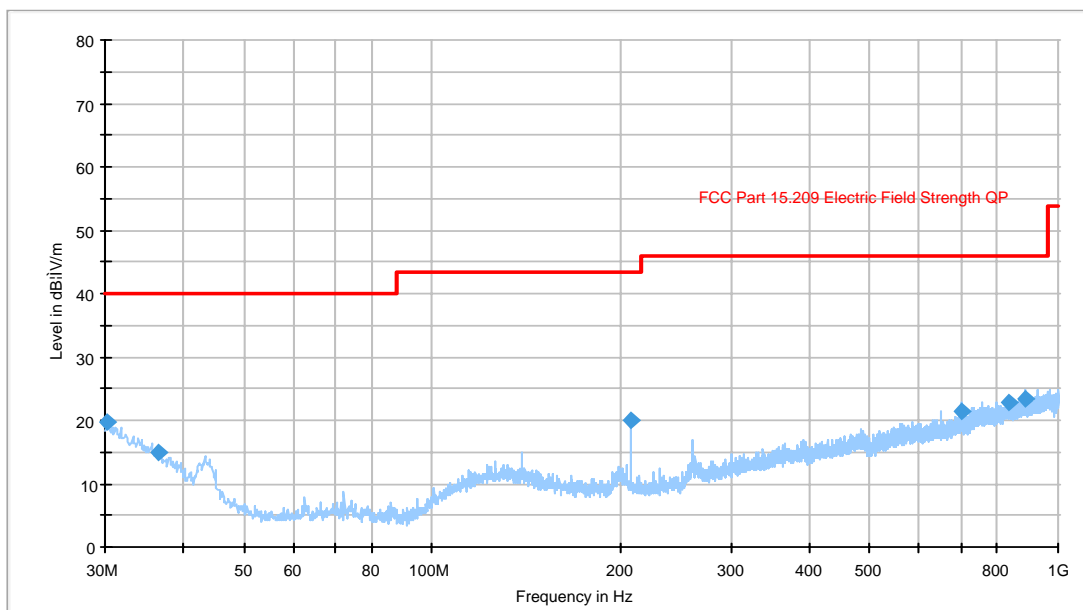
## Test Data

### Environmental Conditions

Temperature:	25 ° C
Relative Humidity:	53%
ATM Pressure:	1000mbar

*The testing was performed by Charmi Peng on 2006-11-23.*

### 30-1000MHz:



Frequency (MHz)	Quasi Peak (dB $\mu$ V/m)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Limit (dB $\mu$ V/m)	Margin (dB)
30.300667	19.8	389.0	H	33.0	-6.2	40.0	20.2
887.411875	23.5	181.0	V	188.0	-2.6	46.0	22.5
837.185250	22.8	396.0	H	256.0	-3.0	46.0	23.2
208.042625	19.9	127.0	H	69.0	-14.4	43.5	23.6
702.062950	21.4	138.0	H	3.0	-5.5	46.0	24.6
36.395500	14.8	165.0	V	331.0	-10.5	40.0	25.2

**Above 1GHz:**

Frequency MHz	Meter Reading dBuV/m	Detector PK/ AV	Direction Degree	Height Meter	Polar H / V	Antenna Factor dB/m	Cable loss dB	Amplifier Gain dB	Cord. Amp. dBuV/m	FCC Part 15.209 & 15.249		
										Limit dBuV/m	Margin dB	Comment
Low channel (2410MHz)												
7230	36.17	AV	261	1.0	H	37.0	4.51	33.7	43.98	54	-10.02	Harmonic
7230	35.83	AV	90	1.2	V	37.0	4.51	33.7	43.64	54	-10.36	Harmonic
4820	33.33	AV	180	1.6	V	34.7	4.64	33.4	39.27	54	-14.73	Harmonic
4820	33.17	AV	270	1.6	H	34.7	4.64	33.4	39.11	54	-14.89	Harmonic
7230	50.33	PK	180	1.3	H	37.0	4.51	33.7	58.14	74	-15.86	Harmonic
7230	50.17	PK	180	1.0	V	37.0	4.51	33.7	57.98	74	-16.02	Harmonic
4820	50.00	PK	250	1.0	V	34.7	4.64	33.4	55.94	74	-18.06	Harmonic
4820	49.17	PK	49	1.2	H	34.7	4.64	33.4	55.11	74	-18.89	Harmonic
2410	90.67	PK	20	1.2	H	29.1	3.61	34.2	89.18	114	-24.82	Fundamental
2410	85.33	PK	18	1.6	V	29.1	3.61	34.2	83.84	114	-30.16	Fundamental
2410	60.27	AV	263	1.4	H	29.1	3.61	34.2	58.78	94	-35.22	Fundamental
2410	54.93	AV	45	1.0	V	29.1	3.61	34.2	53.44	94	-40.56	Fundamental
Middle channel (2435MHz)												
7305	31.63	AV	261	1.0	H	37.0	4.51	33.7	39.44	54	-14.56	Harmonic
7305	31.47	AV	90	1.2	V	37.0	4.51	33.7	39.28	54	-14.72	Harmonic
4870	30.13	AV	180	1.6	V	34.7	4.64	33.4	36.07	54	-17.93	Harmonic
4870	29.97	AV	270	1.6	H	34.7	4.64	33.4	35.91	54	-18.09	Harmonic
7305	47.13	PK	180	1.0	V	37.0	4.51	33.7	54.94	74	-19.06	Harmonic
7305	42.63	PK	180	1.3	H	37.0	4.51	33.7	50.44	74	-23.56	Harmonic
4870	44.13	PK	250	1.0	V	34.7	4.64	33.4	50.07	74	-23.93	Harmonic
4870	43.80	PK	49	1.2	H	34.7	4.64	33.4	49.74	74	-24.26	Harmonic
2435	81.30	PK	20	1.2	H	29.1	3.61	34.2	79.81	114	-34.19	Fundamental
2435	74.30	PK	18	1.6	V	29.1	3.61	34.2	72.81	114	-41.19	Fundamental
2435	50.90	AV	263	1.4	H	29.1	3.61	34.2	49.41	94	-44.59	Fundamental
2435	43.90	AV	45	1.0	V	29.1	3.61	34.2	42.41	94	-51.59	Fundamental
High channel (2450MHz)												
7350	31.63	AV	90	1.2	V	37.0	4.51	33.7	39.44	54	-14.56	Harmonic
7350	31.47	AV	261	1.0	H	37.0	4.51	33.7	39.28	54	-14.72	Harmonic
4900	30.63	AV	180	1.6	V	34.7	4.64	33.4	36.57	54	-17.43	Harmonic
4900	30.13	AV	270	1.6	H	34.7	4.64	33.4	36.07	54	-17.93	Harmonic
7350	44.63	PK	180	1.3	H	37.0	4.51	33.7	52.44	74	-21.56	Harmonic
7350	44.30	PK	180	1.0	V	37.0	4.51	33.7	52.11	74	-21.89	Harmonic
4900	45.30	PK	250	1.0	V	34.7	4.64	33.4	51.24	74	-22.76	Harmonic
4900	42.97	PK	49	1.2	H	34.7	4.64	33.4	48.91	74	-25.09	Harmonic
2450	90.30	PK	20	1.2	H	29.1	3.61	34.2	88.81	114	-25.19	Fundamental
2450	89.20	PK	18	1.6	V	29.1	3.61	34.2	87.71	114	-26.29	Fundamental
2450	59.90	AV	263	1.4	H	29.1	3.61	34.2	58.41	94	-35.59	Fundamental
2450	58.80	AV	45	1.0	V	29.1	3.61	34.2	57.31	94	-36.69	Fundamental

## §15.249(d) – OUT OF BAND EMISSION

### Standard Applicable

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

### Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set both RBW and VBW of spectrum analyzer to 100 kHz with a convenient frequency span including 100kHz bandwidth from band edge.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

### Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	Spectrum Analyzer	8564E	3943A01781	2005-12-8	2006-12-8

\* **Statement of Traceability:** Bay Area Compliance Laboratory Corp. (ShenZhen) Corp. attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

### Test Data

#### Environmental Conditions

Temperature:	25 °C
Relative Humidity:	55%
ATM Pressure:	1016mbar

*The testing was performed by Charmi Peng on 2006-11-6.*

**Test Result:** Pass

*Test Mode: Transmitting*

Frequency (MHz)	Emission (dBμV/m)	Limit (dBμV/m)
2399.9	32.21	54
2483.6	30.96	54